AMENDMENTS TO THE SPECIFICATION

Please replace the paragraph bridging page 6 and page 7 and the next paragraph on page 7, with the following amended paragraphs:

Referring now to **Figure 1**, wherein a block diagram illustrating an overview of the present invention, in accordance with one embodiment is shown. As illustrated, in accordance with one aspect of the present invention, data sender system **102** is advantageously provided with data transmitter **108** of the present invention, to assist a data sending application, such as data sender **104**, to transmit semi-structured data structures, such as XML data structures, as represented by data structures **106**, in a more efficient, compact, and bandwidth reduced manner. As will be described in more detail below, data transmitter **108** effectuates transmission of data structures **106** in the desired manner, by transmitting occurrence frequency based cookie representations of the "tokens", i.e. data elements, of data structures **106** instead. For the illustrated embodiment, the novel transmission of the occurrence frequency based cookie ~~represensentations~~representations are performed, ~~employinig~~employing dictionary **110** and array **112**. As will be described in more detail below, dictionary **110** is employed to store the occurrence frequency based cookie representations for encoding the "tokens", whereas array **112** is used to store the encoded "tokens", i.e. their cookie representations.

In accordance with another aspect of the present invention, data receiver system **114** is advantageously provided with ~~complementarilty~~complementarily equipped data receiver **116** to assist the ultimate data recipient **118** in receiving data structure **106** transmitted in the

above described efficient manner. For the illustrated embodiment, data receiver **116** effectuates the assistance employing dictionary **110'**, which as will be described in more detail ~~beliow~~below, is provided by data transmitter **108**.

Please replace the paragraph on page 8 starting on line 16, with the following amended paragraph:

Similarly, while for ease of understanding, the present invention will be described referencing XML data structures and examples expressed in XML, those skilled in the art would appreciate that the present invention may also be practiced on other data ~~streuturesstructures~~, including but are not limited to HTML or WML encoded contents.

Please replace the paragraph bridging page 8 and page 9, with the following amended paragraph:

Referring now to **Figures 2a-2b**, wherein two block diagrams illustrating the novel data sending and receiving method of the present invention in further detail, in accordance with one embodiment, are shown. As illustrated in **Fig. 2a**, at block **202**, data sender **104** "transparently" sends constituting elements of data structure **106** (such as tag names, attribute names, and attribute values, in the case of an XML structure) in plain text, as in the prior art. That is, legacy data sender **104** may continue to send data as in the prior art without having to make any adjustments to its operation, nor having to be ~~congnizant~~cognizant of the practice of the present invention. However, in alternate embodiments, data sender **104** ~~who's~~ who is

cognizant of the present invention, may further take advantage by sending the data elements of data ~~streuture~~structure **106** in token form. In accordance with the present invention, the data elements are received by data transmitter **108** and turn into token form if received in the plain text form. Data transmitter **108** would parse the received data ~~streuture~~structure **106** to "tokenize" its data elements, using any one of a number of parsing techniques known in the art. Using example "Employees" XML data structure **400** illustrated in **Fig. 4a** as an example, as the constituting elements of example structure **400**, i.e. "<", "Employees", ">", and so forth, are sent "transparently" by data sender **104**, data transmitter **108** receives the constituting elements as "tokens", as illustrated in **Fig. 4b**.

Please replace the three paragraphs starting on page 11, line 4 with the following amended paragraphs:

~~Thereafor~~Thereafter, at block **208**, data transmitter **108** transmits the "tokens" in their encoded representative form. In one embodiment, data transmitter **108** transmits the tokens (implicitly conveying their encodings), and the encoded representations as one contiguous string or stream (to be described more fully below). At block **210**, upon receipt of the list of unique tokens (and their encodings), and the encoded representations, data receiver **116** reconstitutes the original data structure, i.e. regenerating the original data elements based on the received encoding representations and the unique tokens (and their corresponding encoding representations), for ultimate data recipient **118**. As a result, the amount of processing required on the receiver side to accept the transmitted data structure is also significantly reduced. Further, by remapping the tokens back to the original data elements,

the method may be made transparent to legacy data receivers. However, in alternate embodiments, data recipients **118** cognizant of data receivers **116** may further take advantage of the present invention, and reduces its storage employed to store received data ~~streuturesstructures~~ by having data ~~recievorreceivor~~ **116** provides the received data structure in the token form, without reconstituting the original data elements.

Figure 2b illustrates the encoding operation of block **204** in further details, in accordance with one embodiment. As illustrated, at blocks **222** and **224**, data transmitter **108** first encodes the tokens with an initial encoding as the tokens are received/identified, and stores the received/identified tokens in their representative form. Additionally, data transmitter **108** tracks each of the unique tokens encountered, its initial encoding, and more importantly, the occurrence frequency of each of the ~~unqiueunique~~ tokens. For the illustrated embodiment, the ~~intialinitial~~ encoding is simply the order the unique tokens are encountered. For example, for the example "Employee" XML data structure **400** of **Fig. 4a**, the initial encoding employed is as illustrated in **Fig. 4c**. That is, token "<" is encoded with the numeric cookie representation of "0", as it is encountered first, token "Employees" is encoded with the numeric cookie ~~represenationrepresentation~~ of "1", as it is encountered next, and so forth. Thus, example "Employee" XML data structure **400** may be stored in a representative form in array **430a** (corresponding to array **112** of **Fig. 1**) as illustrated in **Fig. 4d**.

Thus, upon receipt of all tokens, i.e. data elements of the data structure being transmitted, the occurrence ~~frequeciesfrequencies~~ of the unique tokens of the data structure would be established. For the example XML data ~~streuturestructure~~ **400**, it would have

established that token "<" occurs 4 times, token "Employees" occurs once, token ">" occurs 8 times (the most frequent), and so forth, as illustrated in **Fig. 4c**.

Please replace the first paragraph on page 13 with the following amended paragraph:

Thus, it can be seen that the encoding or compression operations of the present invention may be performed in a relatively straight forward manner, with relative low memory and processing requirements. As a result, the amount of memory and ~~processing~~processing required on the sender side to "compress" the data elements for transmission (to achieve the desired bandwidth consumption reduction), under the present invention, is also ~~advanageously~~advantageously smaller than other compression techniques known in the art, such as "Zip".

Please replace the paragraph bridging page 13 and page 14 with the following amended paragraph:

Figures 3a-3c illustrate a number of example data structures suitable for use to practice the present invention, in accordance with one embodiment. Shown in **Figure 3a** is example table **300** having at least three columns **302-306**, suitable for use by data transmitter **108** to store the cookie representations (initial as well as final for the earlier described two steps embodiment), the represented tokens, and their occurrence frequencies. An abridged version of example table **300**, without column **306** may be used by data receiver **116** to store the cookie representations, and the represented unique tokens. Shown in **Figure 3b** is

example array **310** having a number storage slots suitable for use by data transmitter **108** to stored the encoded representations (c0, c1, c2 etc.) of the tokens of a data structure being transmitted. Shown in **Figure 3c** is example string or stream **320** having two sections **322** and **326**, separated by delimiters **324a-324b**, suitable for use by data transmitter **108** to transmit the unique tokens (and implicitly convey their encoding representations), and the encoded ~~representaions~~representations of the tokens of a data structure being transmitted. For the illustrated embodiment, first section **322** is employed to transmit the unique tokens (and implicitly convey their encoding representations). Each unique token is preceded by the token size. For example, the token "<" is preceded by the token size value of "0x01", the token "</" is preceded by the token size "0x02", and so forth (as illustrated in **Fig. 4g**). The encoding representation for the token "<" is "1", as implied by the fact that the token is transmitted in the first transmission position, the encoding representation for the token "</" is "3", as implied by the fact that the token is transmitted in the third transmission position, and forth. Referring back to **Fig. 3c**, as illustrated, second section **326** is employed to transmit the encoded representations of the tokens of the data structure being transmitted.